



## Designation: **E438 – 92 (Reapproved 2011) E438 – 92 (Reapproved 2018)**

# Standard Specification for Glasses in Laboratory Apparatus<sup>1</sup>

This standard is issued under the fixed designation E438; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 This specification covers the glasses commonly used to manufacture laboratory glass apparatus.

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>

[C225 Test Methods for Resistance of Glass Containers to Chemical Attack](#)

[C338 Test Method for Softening Point of Glass](#)

[C598 Test Method for Annealing Point and Strain Point of Glass by Beam Bending](#)

[C729 Test Method for Density of Glass by the Sink-Float Comparator](#)

[E228 Test Method for Linear Thermal Expansion of Solid Materials With a Push-Rod Dilatometer](#)

## 3. Classification

3.1 Three types are included, as follows:

3.1.1 *Type I, Class A*—A low-expansion borosilicate glass.

3.1.2 *Type I, Class B*—An alumino-borosilicate glass.

3.1.3 *Type II*—A soda-lime glass.

## 4. Chemical Requirements

4.1 The Type I, Class A and B glasses shall have the major constituents and comply with the restrictions on trace constituents given in [Table 1](#). The major constituents will be varied to maintain the physical requirements as shown.

4.2 Suitable Type II glasses may vary somewhat in chemical composition and still meet essential physical requirements. Two such compositions are shown in [Table 2](#); both are readily available and are used for laboratory apparatus.

## 5. Physical Requirements

5.1 The physical requirements for glasses shall be as prescribed in [Table 3](#). The tolerances listed in [Table 3](#) must be on the published values of the manufacturer's specific glass compositions.

## 6. Keywords

6.1 glasses; laboratory

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee E41 on Laboratory Apparatus and is the direct responsibility of Subcommittee E41.01 on Apparatus Laboratory Ware and Supplies.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.